Table 11-3: CP/M-86 File Extension Conventions

FILE EXTENSION	CP/M-86 INTERPRETATION
.A86	8086 assembly language source code
.BAK	Backup file
.BAS	BASIC source code (CBASIC/86, BASIC-86)
.CMD	Executable command file
.COB	COBOL source code
.DAT	Data file (assumed to be ASCII)
.FOR	FORTRAN source code
.H86	Hex file produced by assembler
.INT	Intermediate compiled code (CBASIC/86, Level II COBOL)
.LST	Listing of compilation or assembly
.OVR	Overlay module
.PRN	Listing of compilation or assembly
.REL	Relocatable object code module
.SUB	Command file executed by SUBMIT command
.SYM	Symbol table of assembly or compilation
.XRF	Cross-reference
.$$$	Temporary, system-generated file

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Valid and Invalid File Specifiers   11.5.3

Examples of valid file specifiers follow:

```
PAYROLL
B:1REPORT
PIP.CMD
BJACK.BAS
A:JOE.SMO
```

The following examples present invalid file specifiers; the notations describe why the examples are invalid:

MARCHPAYROL   File name contains more than 8
                     characters.

B:SALES[2]   File name contains brackets, which are
                     illegal characters.

2:JOE.SMO   Drive name is entered as a number,
                     rather than a letter.

If you attempt to name or save a file with a file name or extension of more than the legal number of characters, CP/M-86 accepts the first eight letters of the file name and the first three letters of the extension as a valid file specifier.

But if you attempt to name or save a file with a file specifier that is invalid in any other way, CP/M-86 responds with the message Invalid Format.

11.5.4 Wild-Card Characters

CP/M-86 wild-card characters allow you to use a single command to perform one task on a group of files.

Use of wild-card characters in CP/M-86 is similar to the use of wild cards in card games; the wild-card characters take on the meaning that you assign to them by matching existing file names.

The two CP/M-86 wild-card characters are the question mark (?) and the asterisk (*).

The ? wild-card character means "match any character—or no character—in this particular location in the file name or file extension." For example, PAY-???.ROL matches each of these file specifiers:

PAY-FEB.ROL   PAY-MAR.ROL   PAY-JL.ROL

The * wild-card character means "pad with ?s." This enables you to refer to entire families of files. For example, *.BAS refers to all files with the extension BAS. As another example, WS*.* identifies any file whose file name (no matter how long) starts with WS, regardless of extension.

Note that * pads all possible characters that follow it, within the file name or the extension where it appears. This means that CP/M-86 cannot read or match any characters following the * in a file name or extension. For example, *86.CMD matches all files with extension .CMD (????????.CMD), not just files ending in 86 with extension .CMD.

Wild-card characters can be used in combination. For example, TEST?.* refers to all files whose file name is four or five characters long, the first four of which are TEST, regardless of file extension. Note that the file specifier *.* refers to all files on the default or designated drive.

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12

CP/M-86 BASIC OPERATING PROCEDURES

This chapter elaborates on some of the operating procedures presented in 11.3 and describes procedures for loading CP/M-86, changing the default drive, and controlling console and printer output via the operating system.

LOADING CP/M-86   12.1

Use the following procedure to load CP/M-86:

1. Be sure both diskette drives are empty.

2. Turn on the system by pressing the switch located at the left rear corner of the processor unit. The LED busy indicator on diskette drive A lights up, and the system displays a power-up display sequence that includes a symbolic request for insertion of the system diskette (e.g., a flashing arrow and a diskette symbol).

3. Insert the system diskette (label up and label-edge last) into drive A and close the drive door. When CP/M-86 is loaded, the system displays a sign-on message (which presents system information, including a keyboard configuration summary) and the CP/M-86 command prompt for the default or logged drive (A>).

CHANGING THE DEFAULT DRIVE   12.2

As described in 11.3, the default drive is the working or currently selected drive. The name of the default drive appears in the CP/M-86 system prompt; for example, the system prompt B> indicates that drive B is the default drive. To change the default drive, respond to the system prompt by entering the letter of the

desired drive, a colon (:), and a carriage return. The following
example illustrates changing the default drive to B from A.

A>b: ↵
B>

12.3 CHANGING THE DISKETTES AT THE CP/M-86 SYSTEM LEVEL

As a general practice, enter ALT-C whenever you change diskettes
at the CP/M-86 system level (when the prompt is >). Entering
ALT-C at the > prompt resets or clears the disk system and logs all
active drives. Active drives include the default drive, drive A (if it
is not the default drive), and any drive specified in CP/M-86
operations since the last loading of the operating system.

CP/M-86 "logs" a drive by building and holding in memory an
allocation map of the directory of the diskette in that drive. When
you enter ALT-C at the > prompt, the operating system always
logs drive A. However, if drive B is the default drive or has been
active in CP/M-86 operations, entering ALT-C logs both drives.

If you attempt to write to a newly inserted diskette without first
resetting the disk system, CP/M-86 does not perform the write
operation and displays the following error message:

Bdos Err On X: R/O

where X represents the name of the drive containing the diskette.
See the "Problem Solving" section for explanation of error mes-
sages.

12.4 CONTROLLING CONSOLE OUTPUT

When operating at the system level (i.e., when the command
prompt is >) and when working with DDT and PIP, you can start
or stop computer output to either the console or the printer with
ALT-P. Starting output to the printer this way causes the printer

to "echo" console display. Stopping output to the console tempo-rarily freezes the screen display. Table 12-1 lists the Alternate characters used to control console output.

Table 12-1: Console Output Alternate Characters

ALTERNATE CHARACTER	FUNCTION
^P	Sends all console output to both LST: (for hardcopy) and CON: (for screen display, if CON: is assigned as CRT:). Re-entering ALT-P stops output to LST:. CAUTION: Unless a printer is on-line, entering ALT-P freezes the operating system; the operating system must be reloaded, and all data in memory is lost.
^S or Pause/Cont Key	Temporarily stops output to CON:. Console (and printer, if output is being echoed to printer) remains frozen until any key is pressed.

LOADING CP/M-86 OR PROGRAMS FROM DRIVE B 12.5

Although CP/M-86 always attempts to load from drive A, the operating system can be loaded from drive B. The option of loading from B is useful if drive A is inoperable for any reason. To load the system from drive B, follow steps 1 and 2 in the procedure in 12.1. Then insert the system diskette in drive B. After the sign-on message appears, the screen displays this disk operating system error message:

Drive = 0, Track = 0, Sector = 0, Error = FA
Bdos Err On A: Bad Sector

Enter ALT-C to reset the disk system and to display the system prompt, A>. Then log onto drive B by entering "b:" followed by a Return.

In addition, you can load any CP/M-86 utility or program from a drive other than the default drive by entering the drive name before the command. For example, to load PIP from drive B while working on drive A —

```
A>b:pip ↵
CP/M-86 PIP VERSION 1.1
*
```

12.6 USING THE HELP COMMAND

The HELP program is an onscreen library of topics explaining CP/M-86 operations, including both resident (built-in) and transient (directory-listed) commands. You can use the HELP command to display explanations and examples for any CP/M-86 commands described in this section.

The format of the HELP command is —

HELP [topic] [subtopic1 subtopic2 ... subtopic8] [P] ↵

To list the topics available in the HELP library, enter HELP followed by a Return at the system prompt.

To display information about a specific topic, follow HELP with a topic and a Return.

For some CP/M-86 topics the HELP screen display lists available subtopics. To display information about a specific subtopic, follow HELP with both a topic and a subtopic.

The next example illustrates using the HELP command to display the list of topics available in the HELP library.

A>help ↵

HELP UTILITY V1.0

At "HELP>" enter topic {,subtopic} ...

EXAMPLE: HELP>DIR EXAMPLES

TOPICS AVAILABLE:

BOOTCOPY	COMMANDS	TOD	REN
DCOPY	ERA	FILENAME	
FORMAT	STAT	SUBMIT	

HELP>

Entering HELP followed by a Return loads the HELP program, which then displays its prompt, HELP>. After you have loaded the HELP program, you can enter a topic (and subtopics) at the HELP> prompt to display a summary of the topic. You can abbreviate the names of topics and subtopics; one or two letters is enough to identify most topics.

Use the [P] option to prevent the screen display from pausing every 23 lines.

Enter a Return at the HELP> prompt to exit to the CP/M-86 operating system.

The following example uses HELP to display general information about the STAT command and a list of any available subtopics.

A>help stat ↵

The next example illustrates a HELP command including a subtopic; the command displays information about STAT command options.

A>help stat options ↵

12.7 USING THE TOD COMMAND

You can examine and set the time of day with the TOD utility. When you start CP/M-86, the date and time are set to the creation date of the BDOS. With the TOD command you can change this initial value to any date and time. You do not have to set time of day for proper operation of CP/M-86.

The command format for TOD is —

tod [timespecification] [P] ↵

When you enter the TOD command with no time-specification, the screen displays the current TOD setting. Entering the TOD command with a time-specification changes TOD to the designated setting.

The TOD time-specification follows the format —

weekday   month/day/year   hour:minute:second

You specify the date with three two-digit values separated by slashes:

▶ Month value, from 1 to 12.

▶ Day value, from 1 to 31, depending on the length of the month.

▶ Year value, the last two digits of the year, from 00 to 99.

You specify time as on a twenty-four hour clock, with hour values 00 to 11 for the morning, and 12 to 23 for the afternoon. Separate the three time values with colons.

The following example illustrates a screen display in response to the TOD command.

```
A>tod ◄┘
12/06/81       09:15:37
A>
```

To set the date and time, use the command form—

tod timespecification ◄┘

The next example sets the current date and time to the last second of 1982.

```
A>tod 12/31/82 23:59:59 ◄┘
```

To let you set the time accurately, the TOD utility displays the message:

Press any key to set time

When the time that you specify in the command occurs, press any key. TOD begins timing from that instant.

Use the P option to continuously print the date and time on the screen. You can stop the continuous display by pressing any key.

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13

DEVICE AND MEDIA MANAGEMENT

CP/M-86 includes these four programs for managing diskette files:

▶ FORMAT formats diskettes for system use.

▶ DCOPY copies a diskette's contents onto another diskette.

▶ BOOTCOPY copies the operating system tracks from one diskette to another.

▶ STAT reports statistics and controls certain characteristics of diskettes and files.

DISKETTE FORMATTING — THE FORMAT PROGRAM   13.1

The FORMAT program prepares diskettes to receive data. In the process, FORMAT automatically erases any previous files on the diskette. New diskettes must be formatted before they can be used by the system.

Using FORMAT   13.1.1

1. Insert the system diskette in drive A and enter—

   format ↵

   Your computer loads FORMAT and displays the utility's one-line sign-on banner near the top of the screen.

2. Once FORMAT is loaded, you can remove the system diskette. Insert the diskette to be formatted in either drive.

3. At the bottom of the screen, FORMAT asks which drive contains the diskette to be formatted, as follows:

Format drive? (A or B; press return key to end.)

Enter the letter name of the correct drive.

4. The system responds by displaying—

Format drive X. Press space bar when ready.

where X is the drive name you entered in step 3.

Check that the diskette to be formatted is in the correct drive (to avoid possible data loss) and press the Space bar.

5. The formatting procedure takes approximately one minute for a single-sided diskette. At the bottom of the screen, FORMAT displays the number of each track as it is formatted. Near the top of the screen, FORMAT displays the message—

Format drive X

where X is the drive name you entered in step 3.

6. When formatting is complete, near the top of the screen, FORMAT displays—

Format drive X complete.

7. FORMAT prompts you to repeat the process. To format another diskette, repeat steps 2 through 5. To end the FORMAT program, insert the system diskette in drive A, and enter ALT-C or press the Return key.

The following example illustrates a sample session using FORMAT to format one diskette. The example shows FORMAT prompts and messages consecutively, as they appear on the screen,

but does not indicate where on the screen the prompts and messages are displayed.

A>format ↵

Diskette FORMAT Utility - Version 2.9

Format drive? (A or B; press return key to end.)b

Format drive B. Press space bar when ready. ⎵

Format drive B

Format drive B complete.

Format drive? (A or B; press return key to end.) ↵

A>

Using FORMAT Switches 13.1.2

You can expand the FORMAT command by including a drive name and optional "switches" that modify FORMAT program operation. These additions must appear in the command line with the FORMAT command stem; a switch value or group of switches must be preceded by a $ (dollar sign). There are four switches:

C — Display the count of the tracks formatted and the number of soft errors encountered.

E — Display the locations of soft errors encountered.

Z — Display disk zone information (size of tracks and gaps).

D — Format a double-sided diskette.

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Tracks are circular sections of a diskette; your computer's diskettes
have 80 tracks on a side. These tracks are grouped into eight zones;
the drive motor runs at a different speed on each zone. Soft errors
are hard-to-read sections or worn or flawed spots on the diskette
that may make it unreliable for use. The $C switch (for counting
tracks and soft errors) allows you to gauge the reliability of a
diskette for recording data. If 15 to 20 or more errors appear,
repeat the FORMAT process a few times. If this number of errors
persists, discard the diskette and try another.

One to four switches may be included in the FORMAT command
line, as follows:

format [drivename:] [$c | e | z | d] ↵

The next example presents the command to format a disk in drive
B and then to display (1) the number of tracks formatted and (2)
the number and the locations of soft errors encountered in the
process. (See Chapter 16 for explanation of FORMAT error mes-
sages.)

```
A>format b: $ce ↵

Soft format error: D=1, T=01, S=12, E=4C
Soft format error: D=1, T=01, S=FF, E=41
Soft format error: D=1, T=01, S=06, E=4A

Format complete.
80 tracks formatted: 3 soft errors.
A>
```

13.2 DISKETTE BACKUP — THE DCOPY PROGRAM

The DCOPY program copies the contents, including the system
tracks, of one diskette onto another diskette, creating a literal
twin of the source or copy-from diskette. In the process, DCOPY
formats the destination or copy-to diskette for CP/M-86
(eliminating the need to run the FORMAT program separately).

There are two methods—long and short—for using DCOPY. With the long method, the program prompts you for the names of the copy-from and copy-to drives. With the short method, you enter the program name and the copy-from and copy-to drive names in a single command line, without prompts from DCOPY.

You can use the long DCOPY method (described in 13.2.1) to copy the contents of one or more diskettes in either drive and to make more than one copy. You can use the short method (described in 13.2.2) to make a single copy of the diskette in the default drive; the copy-from diskette must contain DCOPY. With this method, the system exits the program immediately after the copy is completed.

Several of the optional switches described for the FORMAT program can be included in the DCOPY command (see 13.1.2 and 13.2.2).

Using DCOPY with Interactive System Prompts　　　　　**13.2.1**

Use the following procedure to copy a diskette from either drive and to make multiple copies.

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1. Insert the system diskette in drive A, and enter the following command:

   dcopy ↵

   Your computer loads DCOPY and displays the utility's one-line sign-on banner at the top of the screen.

2. Remove the system diskette from drive A if it is not the copy-from diskette.

3. At the bottom of the screen, DCOPY asks for the name of the drive containing the diskette to be copied:

   Copy from drive? (A or B; press return key to end.)

Insert the copy-from diskette in either drive and insert the copy-to diskette in the other drive. Answer the DCOPY query with the correct copy-from drive name. DCOPY assumes that the remaining drive is the copy-to drive.

4. DCOPY repeats the particulars of the copy command and asks for confirmation:

   Copy from drive f to drive t. Press space bar when ready.

   where f is the name of the copy-from drive, and t is the name of the copy-to drive. Press the Space bar to start the DCOPY process. Press the Return key to cancel the DCOPY command.

5. During the copy process, at the bottom of the screen, DCOPY displays the number of each track as it is copied.

   Near the top of the screen, DCOPY displays the message —

   Copy from drive f to drive t

   When the copy is complete, the system prompts with:

   Copy from drive f to drive t complete.
   Copy from drive? (A or B; press return key to end.)

6. To make another copy, follow steps 3 and 4 above.

   To exit DCOPY (return to the operating system), insert the system diskette in drive A and enter ALT-C or press the Return key.

The following example illustrates a sample session using DCOPY to copy one diskette. The example shows DCOPY prompts and messages consecutively, as they appear on the screen, but does not indicate where on the screen the prompts and messages are displayed.

13-6

A>dcopy ↵

Diskette COPY Utility - Version 2.6

Copy from drive? (A or B; press return key to end.)a

Copy from drive A to drive B. Press space bar when ready. ⌴

Copy from drive A to drive B

Copy from drive A to drive B complete.

Copy from drive? (A or B; press return key to end.) ↵

A>

Using DCOPY without System Prompts   13.2.2

Use the following procedure for the short, one-command DCOPY
method.

1. To copy the system diskette or any diskette containing
   DCOPY, insert the copy-from diskette in the default drive,
   and insert the copy-to diskette in the other drive. Then enter
   the following command:

   dcopy f: to t: ↵

   where f represents the copy-from drive name, and t represents
   the copy-to drive name.

2. At the bottom of the screen, DCOPY displays the number of
   each track as it is copied. When DCOPY has completed the
   copy process, the system displays the following message:

   Copy from drive f to drive t complete.

NOTE: DCOPY's short command form can include the switches D, C, E, and Z, as for the FORMAT program (see 13.1.2). For example, to display the count of tracks copied and of soft errors encountered, and to copy the contents of a diskette in drive A to a diskette in drive B, enter—

A>dcopy a: to b: $c ↵

13.3 OPERATING-SYSTEM COPY — THE BOOTCOPY PROGRAM

The CP/M-86 BOOTCOPY program creates a system diskette by copying the system tracks from a system diskette onto another diskette. The system tracks contain the portion of the operating system that "boots" or loads into memory when you insert the system diskette at power-up or when you press the Reset button to reload the operating system. The system tracks also contain the resident CP/M-86 commands, such as DIR and TYPE, that do not appear on the diskette directory.

For BOOTCOPY to run, the destination diskette must have been formatted with the CP/M-86 FORMAT program. If the destination diskette already contains an operating system, BOOTCOPY writes over it. The BOOTCOPY process does not affect any files on either diskette's directory.

Like DCOPY, the BOOTCOPY program has both a short and a long command form (see 13.2). The following procedure and example depict the long form of BOOTCOPY (with interactive queries from the program). The short, one-command version is described at the end of this discussion.

To copy the operating system tracks from one diskette to another, use the following procedure:

1. Load the operating system (if it is not already loaded) and enter the following command:

bootcopy ↵

After loading, the BOOTCOPY program identifies itself with a sign-on banner and then asks which drive contains the source or copy-from diskette:

Source drive (A/B) ?

2. Enter the source drive name. The program identifies the selected drive and requests confirmation:

Source disk in drive X and press <space>.

where X is the name of the drive entered in step 1.

Make sure that drive X contains the diskette whose system tracks you want to copy.

3. Press the Space bar to begin the BOOTCOPY process. BOOT-COPY reads the operating-system sectors into memory and then asks which drive contains the destination or copy-to diskette:

Destination drive (A/B) ?

4. Place the destination diskette in either drive and enter the drive name. BOOTCOPY displays the following request for confirmation:

Destination disk in drive X and press <space>.

where X is the name of the drive entered in step 3. Press the Space bar to complete the BOOTCOPY process.

5. When the copy is complete, BOOTCOPY displays a confirming message and again prompts for a destination drive:

Bootcopy complete.
Destination drive (A/B) ?

If you want to BOOTCOPY the same system tracks to another diskette, insert another destination diskette and follow step 4.

To exit the program, press the Return key.

To BOOTCOPY from a different source diskette, exit the program and then enter a new BOOTCOPY command.

The following example illustrates a sample session of BOOT-COPY.

```
A>bootcopy ↵

BOOTCOPY  Version 1.6

Source drive (A/B) ?a
Source disk in drive A and press <space>.▓

Reading system sectors...

Destination drive (A/B) ?b
Destination disk in drive B and press <space>.▓

Writing system sectors...

Bootcopy complete.

Destination drive (A/B) ? ↵

A>
```

The command format for the short, one-command version of BOOTCOPY follows:

bootcopy [drivename: to drivename:] ↵

With the short command form, BOOTCOPY exits to CP/M-86 after completing one copy. To BOOTCOPY again, enter another BOOTCOPY command.

DEVICE AND FILE STATUS — THE STAT PROGRAM   13.4

Use the STAT program to display information about diskettes and files, to specify whether file names are to be displayed in the directory, to specify whether diskette contents can be user-modified, and to change physical-to-logical device assignments.

Parameters specified in the STAT command determine what information about the system, the diskettes, or the files is displayed. Refer to Table 13-1 for STAT commands, parameters, and formats.

Table 13-1: STAT Command Options

COMMAND/PARAMETER	BRIEF DESCRIPTION
stat ↵	Displays amount of available storage space on diskette in default or active drive(s).
stat dev: ↵	Displays physical-to-logical device assignments.
stat drivename: ↵	Displays amount of available storage space in specified drive.
stat [drivename:] dsk: ↵	Displays diskette characteristics for active drive(s) or specified drive.
stat drivename:=ro ↵	Temporarily sets a drive to read-only; enter ALT-C to restore RW status.
stat filespecifier ↵	Displays file characteristics and read-write status.
stat filespecifier [size] ↵	Displays file size and read-write status.

Table 13-1: STAT Command Options continued

COMMAND/PARAMETER	BRIEF DESCRIPTION
stat <u>filespecifier</u> {[ro] | [rw]} ↵	Sets file access attribute to read-only (RO) or read-write (RW).
stat <u>filespecifier</u> {[sys] | [dir]} ↵	Makes file a system file or a directory file.
stat <u>logicaldevice=physicaldevice</u> ↵	Changes physical-to-logical device assignments.
stat val: ↵	Lists available options for STAT command parameters.

13.4.1 Available Space on All Drives

When entered with no parameters, the STAT command displays the amount of available disk space and the read/write status of all active diskette drives.

Active drives, as defined in 12.3, include the default drive and any drive previously specified in CP/M-86 operations. As an illustration, once the DIR B: command has displayed the directory of drive B, that drive is an active drive even if it is not the default drive.

To display file information concerning the diskettes in drives A and B when both drives are active, enter the following command:

stat ↵

The following example demonstrates using STAT when drive A contains a diskette with 120K bytes of available storage and drive B contains a read-only diskette with 215K bytes of available storage.

```
A>stat  ⏎
A: RW, Free Space: 120k
B: RO, Free Space: 215k

A>
```

Available Space on a Specified Drive   13.4.2

The STAT command followed by a drive name displays space information for the diskette in the specified drive.

The following example illustrates using STAT to display the statistics for a diskette in drive B that contains 120K bytes of available memory.

```
A>stat b:  ⏎
B: RW, Free Space: 120k

A>
```

File Information   13.4.3 ▮13▮

When followed by a file specifier, the STAT command displays information about the specified file(s). Wild-card characters (? and *) can be used as described in 11.5.

The CP/M-86 STAT display uses the following column heads:

Recs   —The number of 128-byte records in the file

Bytes   —The number of 8-bit bytes (where K means 1024) allocated to the file

FCBs   —The number of File Control Blocks for the file

Attributes — The accessing attributes of the file, which indicate
whether the file is a Directory or a System file, and
whether the file is read-only or read-write.

The next example demonstrates using STAT to display file infor-
mation for all files on the diskette in the logged drive that have
names beginning with S and extensions of .CMD.

A>stat s*.cmd ↵

```
Drive A:                              ┌─────────────┐
    Recs   Bytes   FCBs   Attributes  │ User  : 0   │
     388    50k       4   Dir RW      │ Name        │
      73    10k       1   Dir RW      │ A:SETBPS    │ .CMD
      31     4k       1   Dir RW        A:STAT        .CMD
                                        A:SUBMIT      .CMD
Total:      64k       6
A:   RW, Free Space:     216k

A>
```

You can add an additional column, Size, to the STAT display by
including the [SIZE] parameter. With random (sparse) files the
final record number measured with [SIZE] may be much larger
than the actual number of records allocated. The next example
illustrates using STAT to display size information for a random
file.

A>stat test.dat [size] ↵

```
Drive A:                                    ┌─────────────┐
    Size    Recs   Bytes   FCBs  Attributes │ User  : 0   │
                                            │ Name        │
   10000      17     4k       2  Dir RW       A:TEST .DAT

Total:               4k       2
A: RW, Free Space:        154k
A>
```

As indicated in 13.4.3, if you set the accessing attribute of a diskette or file to read-only, the data in the file or diskette cannot be written over or erased (except with FORMAT or DCOPY). If a diskette or file is set to read-write status, you can modify or erase the data.

The command format to change a file's accessing attribute follows:

srat **filespecifier** {[ro] | [rw]} ↵

Note that the brackets around RO and RW are literal characters that you enter in the command.

The following example sets the file JOE.TXT on drive B to read-only.

A>stat b:joe.txt [ro] ↵

```
B:JOE     .TXT set to Read Only (RO)
A>
```

You cannot write on a file that has been write-protected with the STAT [RO] command until you reset the file's accessing attribute with a STAT [RW] command. The following example illustrates setting the file JOE.TXT to read-write status.

A>stat b:joe.txt [rw] ↵

```
B:JOE   .TXT set to Read Write (RW)
A>
```

The command format to set a drive to temporary read-only status follows:

stat drivename: =ro ⏎

where drivename is the name of the drive containing the diskette.

The next example demonstrates temporarily setting drive B to read-only status.

A>stat b: =ro ⏎

To restore a diskette to read-write status, enter ALT-C at the system prompt.

You can ensure permanent write-protection for a diskette by using a write-protect tab. Covering the write-enable notch on the diskette jacket with an adhesive write-protect tab prevents writing to the disk until the tab is removed.

13.4.5 Excluding File Names from the Directory

You can use STAT to exclude file names from the diskette directory display. The excluded files, known as Sys (system) files, are still available for use although they are not listed by the DIR command. To see the current directory of system files, enter the DIRS command (see 14.1).

Use the STAT [SYS] command to set executable files, such as .CMD (command) files, to Sys status; these files can then be used in different USER areas (see 14.7). Also, in the STAT display (illustrated in 13.4.3) the Attribute of system files is listed as Sys.

Use the following command format to exclude a file name from the diskette directory:

stat filespecifier [sys] ⏎

To reinstate a file name in the diskette directory, use the following command format:

stat filespecifier [dir] ◄┘

Displaying STAT Command Options   13.4.6

Enter the following command to display all the parameters that can be manipulated with STAT:

stat val: ◄┘

The system responds with a listing of the CP/M-86 STAT parameters, as follows:

```
A>stat val: ◄┘
STAT 2.2

Read Only Disk: d: =RO
Set Attribute: d:filename.typ [ro] [rw] [ sys] or [dir]
Disk Status : DSK: d:DSK:
User Status : USR: d:USR:
Iobyte Assign :

CON:  = TTY:  CRT:  BAT:  UC1:
AXI:  = TTY:  PTR:  UR1:  UR2:
AXO:  = TTY:  PTP:  UP1:  UP2:
LST:  = TTY:  CRT:  LPT:  UL1:

A>
```

Displaying Drive Characteristics   13.4.7

To display disk drive characteristics, enter the STAT command followed by a disk drive name and the special term, DSK:. The system responds with a listing of the sizes of the tracks, blocks, and

sectors on the diskette, as well as the capacity of the diskette and its directory.

The following example illustrates using STAT to display the disk drive characteristics of a diskette in drive B.

A>stat b:dsk: ↵

```
      B: Drive Characteristics
   4880: 128 Byte Record Capacity
    610: Kilobyte Drive Capacity
    128: 32 Byte Directory Entries
    128: Checked Directory Entries
    128: Records/Directory Entry
     16: Records/Block
     64: Records/Track
      0: Reserved Tracks
```

A>

13.4.8 Physical-to-Logical Device Assignments

The STAT command assigns a physical device to a logical device name, within allowable physical-to-logical device relationships, as listed in Table 13-2. Four logical devices appear in the first table column. For each logical device, you can assign any of the four physical device names listed beside it in the second column. Physical devices and logical device names are described in 11.2.

Table 13-2: Physical-to-Logical Device Assignments

LOGICAL DEVICE	ASSIGNABLE PHYSICAL DEVICES			
CON:	TTY:	CRT:	BAT:	UC1:
LST:	TTY:	CRT:	LPT:	UC1:
AXI:	TTY:	PTR:	UR1:	UR2:
AXO:	TTY:	PTP:	UP1:	UP2:

One STAT command can assign all four logical devices, provided they are separated by single commas. The command format for assigning physical to logical devices follows:

stat logicaldevice=physicaldevice [,..] ↵

The next example demonstrates changing the auxiliary output device to TTY:, changing the list device to LPT:, and changing the auxiliary input device to TTY:.

A>stat axo:=tty:,lst:=lpt:,axi:=tty: ↵

Use the STAT command with the DEV: parameter to check the physical/logical device assignments. The next example demonstrates displaying the four logical device assignments.

A>stat dev: ↵
CON: is CRT:
AXI: is TTY:
AXO: is TTY:
LST: is UL1:

A>

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FILE SYSTEM MANAGEMENT

CP/M-86 provides six system-level resident or built-in commands and two utility programs that assist in managing files:

▶ The DIR command displays the file names and extensions for the Directory files stored on the logged or specified diskette(s).

▶ The DIRS command displays file names and extensions of System files.

▶ The TYPE command displays the information stored in ASCII files.

▶ The ERA command deletes files from a diskette.

▶ The REN command renames an existing file.

▶ The PIP program (the Peripheral Interchange Program) moves files (or file parts) from one storage device or media to another.

▶ The SUBMIT program allows you to string several commands together in one file.

▶ The USER command displays and changes the current user number.

THE DIR AND DIRS (DIRECTORY) COMMANDS   14.1

The DIR and DIRS commands display the directory listing of file specifiers for files and programs on the diskette in the default or designated drive. Both commands accept wild-card characters in the file specification.

The DIR command lists the names of files in the current user

number that have the Directory (Dir) attribute (displayed by the STAT command in 13.4.3).

The DIRS command displays the names of files in the current user number that have the System (Sys) attribute. Although you can access Sys files stored in user 0 from any other user area, DIRS displays user 0 Sys files only if the current user number is 0.

The format of the DIR and DIRS commands is—

{dir|dirs} [drivename:|filespecifier] ↵

If the DIR (or DIRS) command is entered without a drive name or file specifier, the system displays the directory of Dir (or Sys) files for the diskette in the logged drive.

If a drive name is specified, the system displays the directory for the diskette in that drive. If a file specifier is given, the system lists the file or files (wild-card characters can be used in the file specifier) that match it.

If the diskette directory is empty or if DIR (or DIRS) cannot find a file specifier that matches the given file specifier, the system responds with a message such as NO FILE.

If System (Sys) files reside on the specified drive, DIR displays the message—

SYSTEM FILE(S) EXIST

If non-system (Dir) files reside on the specified drive, DIRS displays the message—

NON-SYSTEM FILE(S) EXIST

You cannot use a wild-card character in a drive specifier.

To display the file directory for the diskette in the default drive, enter the following:

dir ↵

To list the names of all System (Sys) files in the current user number on drive A, enter—

dirs a: ↵

The system responds as shown in the following hypothetical example:

```
A>dir ↵
A: PIP       CMD : STAT   CMD : ASM86 TXT : SUBMIT CMD
A: BOOTCOPY CMD : DCOPY CMD : ED    CMD : FORMAT CMD
A>
```

Three DIR command line examples follow. To display all files on the diskette in drive B (regardless of which drive is currently logged)—

```
A>dir b: ↵
```

The following example illustrates using DIRS to display the names of all Sys files with a file extension of .CMD in the current user number on drive A.

```
A>dirs *.cmd ↵
```

To verify the existence of a Directory file named ACCRED.INT on the diskette in drive B—

```
A>dir b:accred.int ↵
```

THE TYPE (DISPLAY) COMMAND   14.2

The TYPE resident command displays the contents of an ASCII text file. Use the CONT key or ALT-S to stop and start the display. You must give a specific file name; wild-card characters cannot be used with TYPE.

The format of the command follows:

type filespecifier ↵

Two command line examples follow. To display a file named SUMMARY on the diskette in the default drive —

A>type summary ↵

To display the file named MEMO.BAK on the diskette in drive B —

A>type b:memo.bak ↵

14.3 THE ERA (DELETE) COMMAND

The ERA resident command deletes the directory entries of one or more files. Unlike the FORMAT program, which erases the entire diskette, ERA deletes only the directory entry, thereby freeing previously allocated file space for re-use.

Wild-card characters can be used (with caution) to delete groups of files with a single ERA command.

The format of this command follows —

era filespecifier ↵

If CP/M-86 does not find a file with the given file specifier, the system displays the message NO FILE.

The following example shows how to erase a file named ACCOUNTS.BAS on a diskette in the default drive.

A>era accounts.bas ↵

You can erase all files on a diskette with the *.* wild-card characters, as in the next example.

A>era *.* ⏎

The system responds to the preceding command (to erase all files on a diskette) with the message —

ALL (Y/N) ?

Enter Y to erase all files on the logged or specified drive(s). Any other response cancels the command.

THE REN (RENAME) COMMAND   14.4

The REN resident command changes the directory entry (the file specifier) for a file. The format of the command follows:

ren newfilespecifier=oldfilespecifier ⏎

Wild-card characters cannot be used with REN. If the new file specifier named in the REN command already exists, the system responds with the message FILE EXISTS and cancels the command.

Each REN operation takes place on one drive only—either the default drive or the drive named in the new file specifier. If the REN command line names two different drives, the system responds with a non-recognition query and cancels the command.

For example, to rename ACCOUNTS.BAS as BOOKS.BAS on the default drive—

A>ren books.bas=accounts.bas ⏎

To rename PIP.CMD to COPY.CMD on drive B—

A>ren b:copy.cmd=pip.cmd ⏎

14.5 PIP—PERIPHERAL INTERCHANGE PROGRAM

You can use PIP and its command parameters for many file-handling functions. PIP copies, prints, displays, and combines diskette files. PIP can read one or more source files and copy them individually (with the same or new file specifiers) onto another diskette. PIP can concatenate (combine) several files into a single file on the source diskette or on another diskette. It can also copy a portion of a file to another file. Further, PIP can output a file to a peripheral device such as a CRT or printer. Optional PIP command parameters, described in Table 14-1 and in 14.5.3, can modify data as it is copied.

14.5.1 Loading PIP

You can enter PIP commands in either of two ways. The first method is to enter the PIP command stem, followed by a Return (without any file specifiers or parameters). Once loaded in this manner, the PIP program displays its prompt, an asterisk (*), to indicate that it is ready to accept specifiers and parameters. The PIP program remains loaded until ALT-C or a Return — entered as a complete command line — returns the system to CP/M-86.

This method, as illustrated in the next example, allows you to perform a number of PIP operations without re-entering the command stem and reloading PIP for each one.

```
A>pip ↵
CP/M-86 PIP VERSION 1.1
*
```

The second method of loading the PIP program is to use one command line to enter the PIP command stem, file specifiers, and parameters for the operation you are requesting. Pressing the Return key loads PIP, enters file specifiers and parameters, and executes the entire command. After execution, control of the system returns to CP/M-86 (which displays a >). To run PIP again, you must re-enter the PIP command stem plus the command particulars for the next operation.

Except for 14.5.2, the examples in this section show the second (one-line) method of entering PIP commands.

Copying Files with PIP 14.5.2

The general format for PIP commands that copy files follows. Note that you should enter PIP parameters inside square brackets. In the following command format, the first pair of brackets around parameterlist are a typographical device that indicates optional elements (see 10.2, "Section Conventions"). The second pair of brackets are literal characters that you enter in the command line. The use of PIP parameters is discussed in 14.5.3.

pip <u>destination</u>=<u>source</u>[,<u>source2</u>...] [[<u>parameterlist</u>]] ←

The definitions of the three general forms in the PIP command format follow:

Destination — the name of the file or device that will receive the data; destination can include a disk drive or a logical device name followed by a colon. If the destination is a file that already exists, PIP overwrites the file; if the destination is a file that does not exist, PIP creates a file with that name.

Source — the name(s) of the file(s) or device(s) that will be copied onto the destination; source can include a disk drive or device name followed by a colon.

Parameterlist — one or more command parameters (described in Table 14-1) enclosed in brackets, immediately following the name(s) of the affected file(s) or device(s).

The following examples illustrate using PIP to copy file X on the logged drive, calling the new file Y. The first example also illustrates using the one-line method for loading and executing PIP. The second example illustrates the multiline method.

A>pip y=x ←
A>

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```
A>pip ⏎
CP/M-86 PIP VERSION 1.1
*y=x ⏎
* ⏎
A>
```

You can abbreviate PIP commands under some circumstances. Only one file specifier requires a file name when a file is copied from one drive or device to another with no change in the file name itself; CP/M-86 assumes the file name to be the same for both destination and source.

The next three examples demonstrate alternative abbreviated command lines that can be entered to copy file JOE.TXT from the logged drive (A) to drive B, without changing the file name. Note that PIP always assumes the default drive in any file specifier that contains no specific drive name.

```
A>pip b: =joe.txt ⏎
```

```
A>pip b:joe.txt =a: ⏎
```

```
A>pip b: =a:joe.txt ⏎
```

The wild-card character * can be used to manipulate groups of files. For example, to copy all files with an extension of .CMD from drive A (as the default drive) to drive B, without changing the file names —

```
A>pip b: =*.cmd ⏎
```

The next example demonstrates file concatenation (combination) with PIP. Files X, Y, and Z on drive A are concatenated into one file named Q on drive B. Note that the drive name is included in each file specifier.

```
A>pip b:q =a:x,a:y,a:z ⏎
```

You can modify copy operations by including command parameters in brackets in the PIP command. (14.5.1 describes the use of brackets in PIP commands.) Table 14-1 lists the PIP command parameters in CP/M-86; examples illustrating these parameters follow the table.

Table 14-1: PIP Command Parameters

PARAMETER	EFFECT
Dn	Deletes characters extending past column n. Use this parameter to truncate long lines sent to printer or display.
E	Echoes or outputs to the console the characters in the file affected by the PIP operation.
F	Filters or removes the existing form feeds from the file. Use the P parameter in the same PIP parameter list to insert new form feeds.
Gn	Go to user number n.
H	Transfers hex data. Checks all data for proper hex file format. Removes non-essential characters between hex records. System then prompts for corrective action if errors occur.
I	Ignores :00 records in transfer of hex format file. (I parameter automatically sets H parameter.)
L	Translates upper case letters to lower case.
N	Numbers each line, starting at 1 and incrementing by 1. Suppresses leading zeros; line numbers are followed by colons. If N2 is specified, includes leading zeros and inserts tabs following the line numbers. Expands tabs if T parameter is set.
O	Transfers object files (non-ASCII); normal CP/M-86 end-of-file terminator is ignored.

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Pn	Includes one form feed (page eject) every n lines (with initial form feed). If n equals 1 or is omitted, form feeds occur every 60 lines. If F parameter is used, deletes existing form feeds before new ones are inserted.
Qs^Z	Stops copying from source device or file when string s is encountered. If no Q parameter is entered, copying stops at end-of-file. Use S parameter to specify the string from which to start copying.
R	Reads system files (files with directory display suppressed by STAT [SYS] command).
Ss^Z	Starts copying when string s is encountered. Use S and Q parameters (start and quit strings) to select a portion of a file for copying. Copying will start at the file beginning if no S parameter is entered. PIP translates start and quit strings into upper case if the user enters the string on the same line as the PIP command itself. Strings are not translated if the string is entered in response to the PIP prompt (*).
Tn	Expands tabs (ALT-I characters) to every nth column.
U	Translates lower case letters to upper case.
V	Verifies that data has been copied correctly by rereading after write operations (destination must be file).
W	Writes over RO files without console interrupts.
Z	Forces parity (high order) bit of each ASCII character to zero.

Four examples illustrating the use of PIP parameters follow.

To make a copy of X. TXT, renaming it Y. TXT (when both files reside on drive B) and to instruct PIP to echo the file to the

console, translate lower case letters to upper case, and verify the results—

A>pip b:y.txt=b:x.txt[euv] ↵

To copy a portion of file Y. TXT on drive B onto file X. TXT on drive A, starting at the words "Once upon" and continuing to the end of the file—

A>pip ↵
CP/M-86 PIP VERSION 1.1
* a:x.txt=b:y.txt[sOnce upon^Z] ↵

You can use PIP to create and format disk files so that files entered with a text editor or word processing program can be printed within CP/M-86. For example, to output or copy the file X. TXT from drive B to the LST: device, expand tabs every 8 columns, and start a new page every 60 lines (standard text-entry format translated into CP/M-86 PIP parameters)—

A>pip lst:=b:x.txt[t8p60] ↵

To copy the file X. TXT on drive B to the diskette in drive A (keeping the same file name), delete the embedded form feeds, change the page length to 52 lines, and number each line—

A>pip a:=b:x.txt[nfp52] ↵

Outputting Files to Logical Devices with PIP   14.5.4

PIP can "copy" or output files to logical devices as well as to storage media. Table 14-2 lists and describes the logical devices and the special terms you can use with PIP; examples follow Table 14-2 to illustrate the use of these terms.

When a logical device is specified as the source, PIP reads output from that device until encountering an end-of-file marker. When

copying a keyboard entry to a logical device, enter ALT-Z to indicate end-of-file.

When a logical device is specified as the destination, PIP copies or outputs the specified file to that device. For example, specifying the logical device CON: as the destination in a PIP command will display the file contents on the console screen.

The specification of logical devices in PIP commands is subject to physical constraints. When a logical device name appears in either the destination or source fields of a PIP command, the physical device assigned to that logical device (see 13.4.8) must be able to receive or send data as specified. For example, the logical device LST: is an output device and cannot be a source of data.

Table 14-2: Logical Devices and Special Terms Used with PIP

DEVICE	FUNCTION
CON:	Sends the specified data to the console device.
LST:	Sends the specified data to the list device.
AXI:	Reads the specified data from the auxiliary input device.
AXO:	Sends the specified data to the auxiliary output device.
PRN:	Similar to LST:, except that tabs are expanded at every eighth character position, lines are numbered, and form feeds are inserted at the beginning of the file and at every 60th line. PRN: is equivalent to LST:[t8np60].
EOF:	Sends CP/M-86 end-of-file marker (ALT-Z) to destination device.
NUL:	Sends 40 nulls (ASCII 0s) to destination device (this can be issued at the end of punched output).

To concatenate three .A86 files and output them to the CON: device, followed by an end-of-file marker—

A   pip con:=x.a86,y.a86,z.a86,eof: ↵

Backing Up Files with PIP   14.5.5

You can use PIP to copy a working file onto a backup diskette.

If either diskette contains PIP, insert the PIP diskette (containing PIP.CMD) in the default drive and the second diskette in the other drive. Then reset the disk system (type ALT-C at the system prompt), and enter the appropriate PIP command (see 14.5.2).

If neither the working nor the backup diskette contains PIP, the backup procedure involves loading PIP from a third diskette and changing diskettes after the PIP prompt appears.

Note that if you attempt to write (or PIP) onto a newly inserted diskette without first clearing the disk system (entering ALT-C at the system prompt), the screen displays the following error message:

Bdos Err on X:R/O

where X is the name of the drive containing the newly inserted diskette.

To avoid this error condition, clear the disk system with the backup diskette in the destination drive before you enter the PIP command.

Use the following procedure to copy a file from one diskette to another when neither diskette contains PIP.

1. Insert the destination or backup diskette in drive B.

2. Insert a diskette containing PIP.CMD in drive A. Enter ALT-C at the system prompt to clear the disk system in preparation for writing to the diskette in drive B.

3. At the system prompt, enter PIP followed by a Return. After the PIP prompt appears, replace the diskette in drive A with the copy-from or source diskette.

4. Complete the PIP command by supplying the destination and source file specifiers (see 14.5.2).

The following example demonstrates how to copy the file TEXT.DOC onto a backup diskette in drive B when neither the working nor the backup diskette contains PIP.

SCREEN DISPLAY	PROCEDURE
	(Insert PIP diskette and destination diskette in drives A and B, respectively.)
A>^C A>pip ↵	
CP/M-86 PIP VERSION 1.1	(Remove PIP diskette and insert source diskette in drive A.)
*b:=a:text.doc ↵ * ↵ A>	

14.6 THE SUBMIT COMMAND AND .SUB FILES

SUBMIT is a CP/M-86 utility that enables you to perform a series of CP/M-86 tasks with one command. Each SUBMIT command executes a user-generated list of CP/M-86 commands stored in a specified diskette file identified by the file extension .SUB. The commands in the .SUB file can contain substitution parameters for which specific values—such as file names—are substituted via the SUBMIT command. For SUBMIT to run, SUBMIT.CMD must be on the diskette in the default drive (see 11.3 and 12.2); the submitted file may be on another drive if the drive name is included with the .SUB file name.

Each .SUB file is composed of a list of CP/M-86 commands that the computer performs when executing the .SUB file. To create .SUB files, use a text editor.

You can create a master .SUB file by creating a .SUB file that includes variables called substitution parameters. When entering the SUBMIT command, you enter values for the substitution parameters. In a master .SUB file, a substitution parameter is indicated by a dollar sign ($) followed by an integer, called the parameter number. The first variable in a command file is represented by the parameter $1, the second by $2, and so forth. If the .SUB file contains no substitution parameters, you cannot vary the contents of the submitted file.

When the .SUB file is executed, SUBMIT pairs the parameters specified in the SUBMIT command with substitution parameters $1 through $n in the .SUB file.

Entering another SUBMIT command as the last command in a .SUB file creates chained command files.

The format of the SUBMIT command follows:

submit <u>filename</u> [<u>parameterlist</u>] ⏎

where filename is the .SUB file name (entered with or without the .SUB extension) that contains the prototype commands to be executed, and parameterlist is the list of parameters, separated by blanks, to replace the substitution parameters named in the master .SUB file.

For example, suppose the file ASMBL.SUB contains the following CP/M-86 commands:

```
ASM86 $1
DIR $1.*
ERA *.BAK
PIP $2:=$1.PRN
ERA $1.PRN
```

To execute the commands listed in file ASMBL.SUB and to substitute REPORT1 for $1 and PRN for $2 in the .SUB file—

A>submit asmbl report1 prn ◄┘

SUBMIT reads the .SUB file, substitutes REPORT1 for all occur-rences of $1 and PRN for $2, and creates a file named $$$.SUB that contains the following commands:

    ASM86 REPORT1
    DIR REPORT1.*
    ERA *.BAK
    PIP PRN:=REPORT1.PRN
    ERA REPORT1.PRN

SUBMIT creates the $$$.SUB file on drive A. When SUBMIT executes the $$$.SUB file, drive A is automatically logged. There-fore, all the commands listed in the .SUB file must reside on the diskette in drive A, and the diskette must be RW. Command processing is aborted if any system error occurs during execution of a $$$.SUB file.

THE USER (DISPLAY AND SET USER NUMBER) COMMAND   14.7

The USER resident command displays or changes the current user number. To display your current user number, enter—

user ◄┘

You can divide the disk directory into distinct groups according to user numbers. Files you create under one user number are inacces-sible under other user numbers. However, you can make the files accessible to other user numbers with the STAT [SYS] command. You can move files between user areas using PIP with the G parameter.

When you start CP/M-86 the current user number is 0; the user number will remain 0 unless you change it with the USER command.

To change the current user number, use the command—

user n ↵

where n is a user number in the range 0 to 15.

You can also use the USER command to find out what user number a file was created under. To display a list of user numbers that have files associated with them, enter the command—

stat usr: ↵

The following example illustrates displaying the current user number with USER.

```
A>user ↵
0
A>
```

The next example demonstrates changing the current user number to 3.

```
A>user 3  ↵
```

If you are in User 3 and want to get a file named X from User 7, use PIP as in the following example. The example assumes that PIP.CMD is a Sys file in either User 3 or User 0's directory.

```
A>pip y=x[g7] ↵
```

15

SOLVING PROBLEMS

This section describes how to locate and solve problems you have with your computer. The first chapter describes how to solve general problems and how to prepare for a service call. The second chapter describes how to respond to error messages that the computer may display.

When you have a problem, first examine the situation:

► Don't become alarmed. You can solve most problems yourself in a few minutes.

► Note if an error message is displayed and whether the computer is making unusual noises.

► Note what you were doing when the problem occurred. This includes the type of operation and the program name (and version number, if possible).

Most problems you can have while doing the procedures described in this guide are indicated by error messages. Chapter 16 lists the error messages and describes recovery procedures.

If you are using an application program when the problem occurs, refer to the program's user guide. The guide will explain how to respond to error messages displayed by the program.

If no error message is displayed, refer to "General Problem Solving," below.

Some computer problems must be corrected by a computer techni-
cian. If you have a problem that persists, or if your problem is not
described in Table 15-1, you may need a service call. Part 15.3
describes how to prepare for a service call.

15.1 GENERAL PROBLEMS

Table 15-1 describes how to solve problems that are not indicated
by an error message.

Table 15-1: General Problem Solving

PROBLEM	SOLUTION
Display is blank and there is no fan noise.	1. Turn off the power and check the power cord plug for proper connection. 2. Check the wall socket for power by plugging in another device (such as a lamp). 3. Replace the fuse (as described in 15.3).
Display is blank or very dim, but there is fan noise.	1. Turn off the power and check the display connector for proper connection. 2. Try to increase display brightness.
The operating system does not load and there is no drive noise.	(Call your service representative.)
The operating system does not load, but there is drive noise.	1. Check that the brightness is adjusted properly. 2. Try to load the operating system with a backup system diskette.
When loading an application program, there is drive activity, but the computer "hangs up" before the first frame of the program.	Some application programs require that you first load a programming language module. Check that you loaded the proper module.

| PROBLEM	SOLUTION
The display freezes and the computer does not respond to your commands.	1. If you are using CP/M-86, type one or more ALT-Cs. 2. Check the keyboard connector for proper connection. 3. Press the reset button.
The computer displays what you have typed, followed by a question mark.	1. Check what you have typed for errors. Retype the material correctly. 2. If you are loading a program, check that the program is on the diskette or volume you are using.
Repeated inconsistent or erratic results	The most frequent cause of this type of problem is a worn or damaged diskette. Retry the operation or try your backup diskette.
Bell sounds.	While using the calculator field, you have typed a key that cannot be used in calculations, or you have typed a number that is more than 14 digits long.

HOW TO REPLACE THE FUSE   15.2

The fuse holder is located on the rear of the processor unit (Figure 15-1):

15-1: Replacing the Fuse
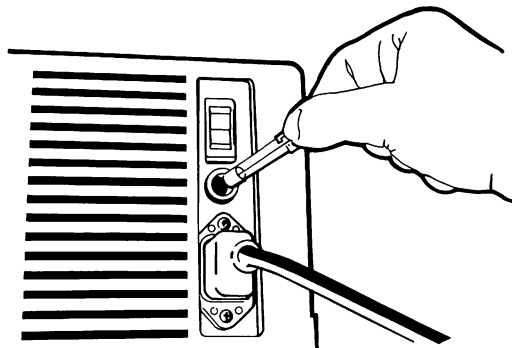
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If the fuse burns out, you can have your service representative change it for you or you can change it yourself. To replace the fuse:

1. Turn off the power for the main unit and for the hard disk.

2. Disconnect the power cord.

3. Open the fuse holder with a coin or screwdriver.

4. Replace the burnt out fuse with a new fuse obtained from your dealer. Only use fuses obtained from your dealer for your computer.

5. Close the fuse holder.

6. Reconnect the power cord.

7. Turn on the power.

15.3 HOW TO PREPARE FOR A SERVICE CALL

Contact your service representative if you cannot solve a problem yourself. Before calling for help, make sure you have the following information:

▶ A complete description of the problem, including error messages.

▶ The program and data diskettes you were using when the problem occurred.

▶ Model and serial numbers of your:

— Keyboard   — Processor unit

— Display unit   — External hard disk

▶ Who to see if you are not in the office when help arrives. Be sure that person has your diskettes and notes on the problem.

▶ Your business hours and phone number.

16

ERROR MESSAGES AND ERROR CODES

The computer generally displays an error message when it encounters a problem. The following lists the error messages you may see while doing the procedures described in this guide. With each message is a description of how to correct the error.

Some error messages contain 2-digit error codes. The error codes are described in 16.2.

ERROR MESSAGES 16.1

The error messages are listed in alphabetical order, except for the messages you may see while loading the OS. These messages are at the front of the list.

X 01

OS loading error: Check that you have inserted your system diskette label-side up and label-edge last. Reinsert the diskette correctly.

X 02

OS loading error: Check that both drive doors are open. Reinsert your system diskette in drive A.

X 99

OS loading error: The diskette in drive A does not contain an operating system. Remove the diskette and insert a system diskette.

X nn
(where nn is a number other than 01, 02, or 99)

OS loading error: Your system diskette may be faulty. Try again with a backup diskette.

M X nnnnnn

OS loading error: The diskette in drive A may be faulty. Try again with another diskette.

ABORTED: filespecifier

PIP error: The user has aborted a PIP operation by pressing a key.

Allocation error for file filename

CHKDSK error: The named file had a data block allocated to it that does not exist (that is, a data block number larger than the largest possible block number). CHKDSK truncates the file short of the bad block.

Allocation unit is too small

HDSETUP error: Return to command mode, type the C command, and re-enter all attributes, including a larger allocation unit. Be sure to choose one of the allocation unit options displayed with the command.

Archive Library mis-match!! The archive Library last being restored to volume <X> does not match the Archive Library of the inserted diskette.

ARCHIVE error: Restart the restore using the correct archive Library or redo from the start.

Assignments are in default order

HDSETUP error: Drive assignments have not been made. Return to command mode, type the A command (assign), and make drive assignments.